

**CHAPTER 5**  
**APPENDIX 5B**

**Mayo Generating Station**  
**Hydrometric Data**



## MAYO GENERATING STATION HYDROMETRIC DATA

### 1.0 Data Sources

Hydrometric data sources available for the Mayo River watershed are:

- Water Levels from the Water Survey of Canada
  - Station 09DC005 "Mayo Lake Near the Outlet"  
This consist of daily water levels measured from 1979 to 2009
  - Station 09DC004 "Wareham Lake at the Headgate"  
This consist of daily water levels measured from 1979 to 2000
- Daily water Levels and flows (Yukon Energy Corporation data)  
YEC records include:
  - Recorded daily water levels at Mayo and Wareham Lake (1987 to present)
  - Computed Mayo Lake outflows, calculated from the theoretical rating curves for the Mayo Lake outlet structure, the recorded lake levels and the settings of the outlet structures as well as overflow spillway flows (1987 to present)
  - Computed daily Wareham Lake sluiceway outflows, based on the sluiceway rating curve, recorded gate openings and recorded lake levels (1987 to present)
  - Computed daily turbine discharges at the Mayo Generating Station from turbine operating records (1987 to present)
- Monthly averaged values (Yukon Energy Corporation data)
  - Mayo Lake water levels from 1958 to present
  - Mayo Lake outflows from 1958 to present
  - Mayo Lake inflows from 1958 to present

### 2.0 Structure Information

#### *Mayo Control Structure*

- Outlet Structure consists of 3 gated Conduits and Overflow Spillway with flashboards
- Conduit Capacity 11.5 m<sup>3</sup>/s (each)      34.5 m<sup>3</sup>/s total
- Surface Area of Mayo Lake – 96.68 km<sup>2</sup>
- Drainage Area to Mayo Lake      1770.6 km<sup>2</sup>

#### *Mayo Generating Station (Wareham Lake)*

- Powerhouse Structure      Max Capacity ~ 15 m<sup>3</sup>/s
- 2 Gated sluiceways
- Surface Area of Wareham Lake – 3.734 km<sup>2</sup>
- Local Drainage Area Mayo Lake to Wareham Lake - 857.9 km<sup>2</sup>

### 3.0 Comments on the available data

The computed flows at Mayo Lake Control and at the Mayo GS (Wareham Lake Outflows) are based on theoretical rating curves for the outlet structures. The rating curves for these are well defined with an error in the order of 5%. The estimate of the flow is based on unobstructed water passages including little head loss across trash racks. Debris blockage would reduce the available head. The loss of capacity would depend on the degree of blockage and the discharge through the conduits with lesser losses for lower outflows. Anecdotal observed information indicate that debris can accumulate at the trash rack and potentially in the conduit downstream from the gates at the Mayo Lake Control Structure. No quantitative information is available on either the degree of blockage nor the duration (frequency of debris removal). It is therefore not possible to determine the effect of the blockage on the computed flows from the Mayo Lake control structure. At minimum quantitative information regarding the head loss across the entrance gates at times when there is significant debris blockage would be required to at least be able to qualitatively define the effect on the computed discharges. Nevertheless, based on the expected reduced losses for lower flows, it is expected that there would likely be little head loss with discharges less than 10 m<sup>3</sup>/s.

The monthly averaged values listed in Section 1.0 provide the longest period of record among the data sources readily available.